Book4U Database Model

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I. Requirement Analysis

1.1 Introduciton

This application stores the information and constraints of a forum website about books. The project is to create a: “Yelp-like” book rating website to share and rate books. The website will create a social network community where the registered user can view books from different categories, share their review and comment on others’ review. Since there will be a lot of data and manipulation associated to it, therefore a database management is crucial for this project.

1.2 Functional requirements

1. Member structure entry shall be composed of username, email address, password and a unique automatic generated User ID by the system as well as an association to every rating(and review) and comment the member made.
2. Book structure entry shall be composed of the title of the book, the name of its authors, a brief description(word count limit:400), the year of release, its edition and a unique automatic generated ID. There will also be a isvisible attribute, which will be used to keep a book private within the database.
3. Author structure entry shall be composed of the name, introduction of author, book written by author and a unique generated ID.
4. The database shall track all the rating and reviews made by every member on every book linked by their auto-unique IDs with the time at which it was published.
5. The database shall keep a list of Moderators.
6. The member shall be able to access functionalities via a UI.
7. The member shall be able to access the sign-up page and enter the information required to create an account.
8. Member’s password should be encrypted and protected.
9. The maximum length of a textreview or a comment should be limited to 400 characters.

1.3 Database description

Entities and their attributes

User: A user is a member of the website. A user has several attributes: its artificial and unique user ID, name that appears on the forum, password, Email address, Gender, a personal intro about himself, and a privacy option where he can choose to show his information or not.

Moderator: A moderator is a user as well. it is an promoted user by the forum. A moderator would have more advanced permissions on website. Such as delete an inappropriate comment.

Books: Book is of course one of the main entity of this forum website application. Its unique primary key “bid” is the artificial id generated by the database management system while adding. A book has its ISBN(International Standard Book Number), a name, one or many authors, its publishing date, publisher company. There is another feature attribute called isvisible. In our system, an user can add a book to the website. Once the moderator verifies the new added book, that book will be set to visible and all user will see it. Users cannot rate a book unless it is set to visible by moderator.

Book-Category: Every single book must have its associated category or multiple categories. A user can also choose the categories that he interests in. This relation will be explained in detail in the relationship part.

Review: A review is an evaluation, or an opinion to a book based on its content and style, etc. A review relies on a book, in other words, it is a weak entity depending on book. A review has its own reviewID, the BookID where this review address to. A rating is necessary in an review, it cannot be empty, but the text review can be blank. There is a word limit of up to 200 words for a review. A review can be updated many times.

Comment: A comment is a statement toward a review. Since it is the website is in forum format and tends to create a social network community for book lovers, feature of commenting a review would be necessary as well in this model. All comments under a review has a unique index within that review. The maximum length of a comment is 400 words.

Author: An author is the creator or originator of a book. It contains a auto-generated ID, aid, name, and an optional brief summary.

Vote: All users can use "vote" function to agree or disagree a review. A user can vote in a review only once, but can update it later. A Vote is unique by combining rid and uid. A vote also has isUpVote and isDownVote attributes to represent agree or disagree.

Purchase Link: A book can have one purchase link provided by a seller, and many sellers may sell a same book. A purchase link is unique by combining bid and sid. A purchase link has a URL that must not be NULL.

Seller: A seller can provide purchase link for books. A seller has a unique auto-generated sid.

Relationships

AddBook: An user can add a book which is not in the database yet. Since the application is a website forum, they should be free to add a book. Once a book is added, it is not visible yet. It has to be reviewed and accepted by a moderator in order to be public.

Review: An user can write a review to a book. The review has a rating from 1-5 stars. It is necessary in the rating. In the review, user can also post a written review (Limited to 200 words) about the book.

Comment: User can write comment to a review. It the essential idea of a forum. Where the review is like a post, and comment is the replies to this post.

Vote: User can vote to a review only once, but can update it later. A vote is either thumb up or down.

Interests: User can select one or many specific categories of interests. This information will be used to make a recommendation to the users.

Owns: A book must be written by one or many authors.

Classification: A book must be classified into one or many categories.

Review Deletion: Moderator can delete reviews that are off-topic or violates the users' agreement(sexual,racial comments or abuse,harass other users).

Ban: Moderator can ban users to suspend their accounts for a duration of time. A ban is a punishment for users that spams or keeps adding off-topic/bad reviews or comments.

ProvideLink: A seller can provide purchase link for books.

Haslink: A book can have one or many purchase links, each from a different seller.

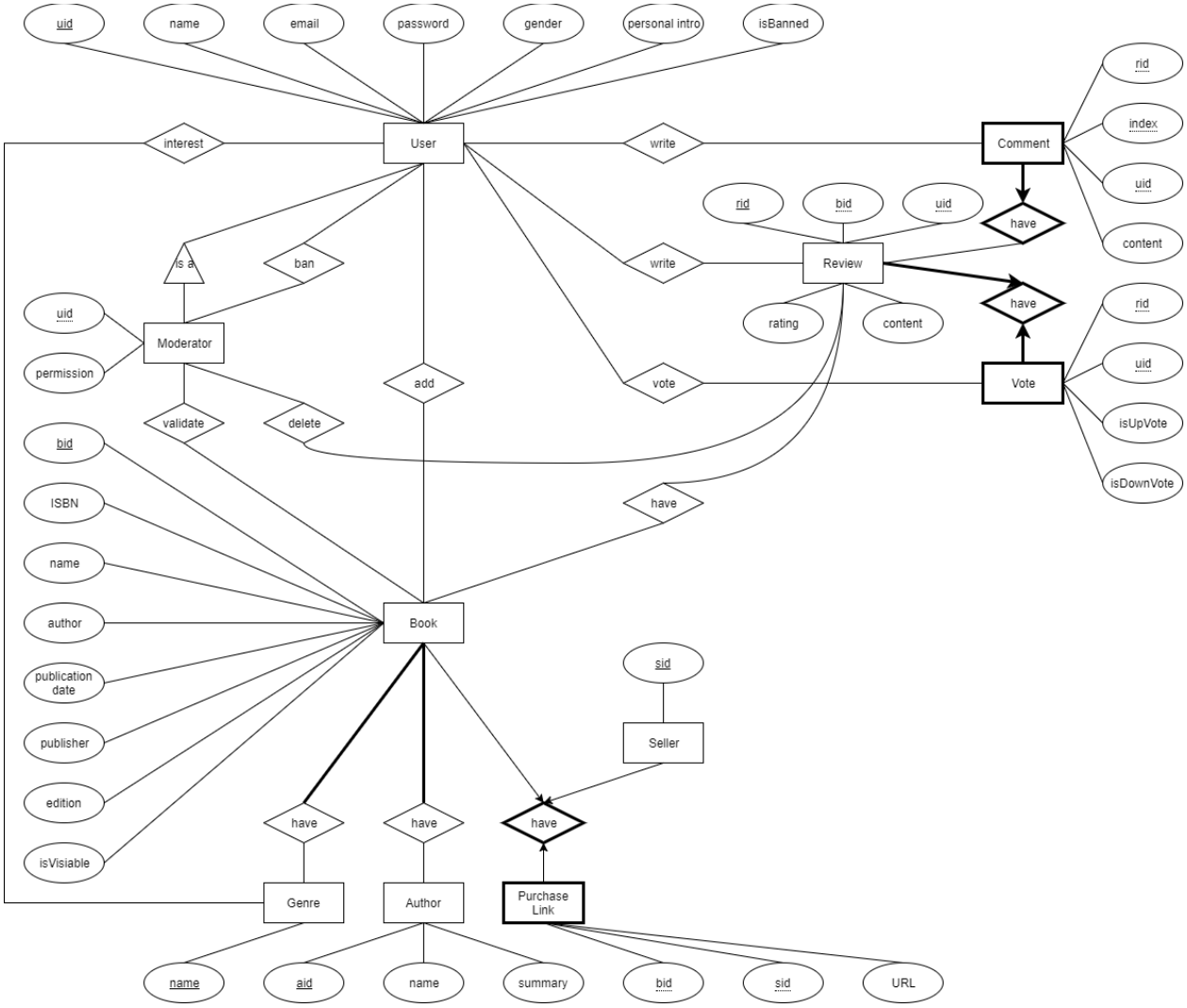
Note:

1. We assume there is only one Administrator, so no need to store it in the databse.
2. Password in User are encrypted by a choosing algorithm.

3 **We are missing some required database for recommended book list function, set profile to private, and black list function. [TO DO]**

4 **Purchase Link and Seller are not included in the project prepartaion. [TO Discuss]**

II. ER Diagram



III. Relation Model

Entities and their attributes

1. User(uid, name, email, password, gender, personal intro, isBanned)
2. Moderator(uid, permision) ISA user (uid REF User)
3. Book(bid, ISBN, name, author, publication date, publisher, edition, isVisiable) (author REF Author)
4. Genre(name)
5. Review (rid, bid, uid, rating, content) (bid REF Book, uid REF User)
6. Comment(rid, index, uid, content) (rid Ref Review, uid REF User)

7. Author(aid, name, summary)
8. Vote(rid, uid, isUpVote, isDownVote) (rid Ref Review)
9. Purchase Link(bid, sid, URL)
10. Seller(sid)

Notice that since Google Doc doesn't support dotted underline, we grayed out the foreign keys.

Relation

1. User add books.
2. User - review - books (Ternary)(rating not NULL)
3. User can write comment under a review.
4. User can vote a review(Up or down).
5. User can interest in one or many specific category.
6. A book must have one or many aurthors.
7. A book must have one or many categories.
8. Moderator can delete review.
9. Moderator can ban users.
10. Seller provides Purchase Links.
11. Books can have purchase links.

Constarint

Username and email cannot be NULL.
Moderator approve book-add (change an attribute, from invisible to visible).
Rating cannot be NULL in Review.
Reviews can be updated.
At least one of the isUpVote and isDownVote is false.
URL cannot be NULL in purchase link.

Other constrains:
Limited amount of vote per day.
A registered user can only add up to 2 books up day to avoid spam.